In the specification:

Please amend paragraphs **[0013]-[0016]** as follows:

[0013] Microresonator 112 may be fabricated by first depositing SiO_2 or $AlSiO_X$ and then introducing excess silicon either during the deposition process or following it using ion implantation. The samples then may be patterned with round disks and rings using a mask with waveguides and microresonator microcavities. Subsequently, the oxide ~~maybe~~ may be etched using either buffered oxide ~~etch~~ etching or by dry etching to result in microring 120 structure in FIG. 1 or microdisk 118 structures shown in FIG. 2 and FIG. 3. The samples may be annealed at 1100°C in a furnace to form silicon nanocrystals. Microresonator 112 may be fabricated by forming silicon (Si) or silicon-germanium (SiGe) nanocrystals in a SiO_2, $AlSiO_X$ or SiON matrix. The nanocrystals may be formed using a number of different techniques such as ion implantation. Ion implantation may also be done after creating a masking layer of photoresist so that silicon may be implanted into the oxide in a desired shape of the microresonators 112. In the event higher quality factors are desired, disks and rings can be annealed for example using a CO_2 laser that momentarily melts the surface, although the scope of the invention is not limited in this respect.

[0014] Microresonator 112 may provide a resonant frequency spectrum that is a function of the size of the microresonator 112. An ideal microresonator 112 may be defined as being able to confine light indefinitely without loss and would have resonant frequencies at precise values. The quality factor (Q factor) of microresonator 112 may describe deviation from an ideal microresonator. Higher quality factors may be obtained, for example, by minimizing surface roughness that may cause light scattering. Surface roughness may be a determining factor in waveguide losses, so the techniques utilized to reduce surface

roughness in waveguides may be similarly applied to microresonator 112. With lower losses as obtained by reduced surface roughness, stimulated emission may be obtained as photons travel around the microresonator, and in one embodiment lasing may be obtained, although the scope of the invention is not limited in this respect. In one embodiment of the invention, stimulated emission may be obtained by utilizing silicon nanocrystals in SiO_2 for example by utilizing pulsed pumping, although the scope of the invention is not limited in this respect.

[0015] Referring now to FIG. 4, a diagram of simulations of light coupling from a waveguide to a microring resonator in accordance with an embodiment of the present invention will be discussed. The simulations 410, 412, and 414 of FIG. 4 show the field distribution after a discrete Fourier transform (DFT) for the center wavelength in a waveguide 114 adjacent to a microring 120 microresonator 112 as shown in FIG. 1. Simulation 410 does not contain an integer multiple of wavelengths around the ring for a wavelength of 1650 nanometers. Simulation 412 shows a near integer multiple of wavelengths in the ring for a wavelength of 1400 nanometers. Simulation 414 shows an integer multiple of wavelengths for a wavelength of 1413 nanometers. As can be seen in the simulation 414, the field strength is higher in microring 120 than in waveguide 114 because microring 120 is in a resonance condition. In accordance with one embodiment of the invention, microring 120 may be formed to have an overall length measured from the center of the waveguide portion of the microring that forms the ring structure, making the ring being an integer multiple of a desired wavelength. Such a length may be calculated as $2\pi R$ where R is the radius from the center of the ring structure to the center of the waveguide forming the ring structure, although the scope of the invention is not limited in this respect.

[0016] Referring now to FIG. 5, a cross sectional diagram of a microring resonator with a waveguide disposed in position above the microring resonator for coupling in accordance with one embodiment of the present invention will be discussed. As shown in FIG. 5, a microring 120 microresonator 112 is patterned on a silicon substrate 110 by forming nanocrystals in silicon dioxide. A waveguide 114 may be formed subsequent to forming the microring 120 microresonator 112 so that the waveguide may be disposed above microring 120. Forming the waveguide 114 to microring 120 in a vertical direction allows for greater control of the amount of coupling between waveguide 114 and microring 120 by adjusting the thickness of the films versus horizontal coupling where the coupling distance would be affected by the lithographic process. In one embodiment of the invention, the coupling distance between waveguide 114 and microring 120 may be approximately 250 nanometers, or within 250 nanometers, although the scope of the invention is not limited in this respect. Likewise, pump 122 to excite circulation of light in microring 120 may be disposed on top of microring 120, although the scope of the invention is not limited in this respect.